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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/469,317	12/22/1999	HYUN-EUN KIM	P64146US0	4832

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400 SEVENTH STREET NW  
WASHINGTON, DC 20004

EXAMINER
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SOLOMON, GARY L

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 03/10/2004

5

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/469,317

Applicant(s)

KIM ET AL.

Examiner

Gary L Solomon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

2. Applicant's arguments and amendments to the claims have overcome the previous grounds of rejection. However, new grounds of rejection are as follows:

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yiannoulos (US 5,982,318) in view of Xie (US 5,874,994) in further view of Xiao (US 6,137,432).

5. For claim 1, Yinnauolos discloses an apparatus for converting an analog image data into a digital image data in a CMOS image sensor including a pixel array having M (row lines) X N (column lines) color pixels (Column 2, Lines 45-48), wherein the color pixels include a first color for sensing a first color, a second color for sensing a second pixel, and a third color a third color pixel (Column 9, Line 60 through Column 10, Line 5).

However, Yiannoulos does not teach having two color pixels selected among the first to third color pixels. Nevertheless, one of ordinary skill in the art would know that the placing of the notoriously well-known Bayer Filter (Xie; Figure 6; Column 5, Lines 45-47) placed in combination with the Yiannolous invention would allow for the selection of two of the three-

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color pixels (Xie; Figure 6). The Bayer array is the same pattern as the applicant presents in his figures. In each column of the Bayer Filter, only two color pixels are present: Red and Green or Green and Blue. This would cause for only two of the three-color pixels to be selected.

Yiannoulos also discloses the analog reference generating means for generating different analog reference voltages according to the first to third color pixels, wherein the different analog reference voltage has a different value and a different decline rate (Column 10, Lines 1-45).

Although, Yiannoulos and Bayer teach all the previous limitations, they lack the selecting means, in response to the control signal, for selecting one of the two analog reference voltages respectively corresponding to one of the two color pixels included in the column array.

However, the combination of Yiannoulos and Bayer would allow for the selecting means of Xiao (Figure 2) to be used. Since 2 colors would be sent from the Bayer Filter, the selector of Xiao would select one of the two analog reference voltages respectively corresponding to the two color pixels included in the column pixel array (Xiao; Figure 2, Element 27 and 28; Column 2, Lines 30-41).

Xiao further teaches a comparing means for comparing the selected analog reference voltage and the analog image data to generate the digital image data corresponding to the color pixels (Column 2, Lines 15-41; Figure 4).

The conversion operation of the analog image data into the digital image data is differently carried out according to the different color characteristics as is taught by Yiannoulos in Column 10, Lines 5-35).

The combination of Yiannoulos and Xiao would have been obvious to one of ordinary skill in the art at the time of this invention in order to use the common Bayer Filter Pattern.

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Therefore, it would have also been obvious to one of ordinary skill in the art at the time of the invention to configure the Yiannoulos, Xie, and Xiao teachings in order to thereby significantly reduce power when converting analog pixel data into digital pixel data from an APS Array (Xiao; Column 1, Lines 50-60).

For claim 2, the Yiannoulos, Xie, and Xiao references disclose all the previous limitations and also, wherein the analog reference voltage generating means includes:

a first reference voltage generator for generating a first reference voltage with respect to the first color pixel;

a second reference voltage with respect to the second color pixel; and

a third reference voltage with respect to the third color pixel (Column 10, Lines 24-30).

For claim 3, the Yiannoulos, Xie, and Xiao references disclose all the previous limitations. In the Bayer Pattern, as is disclosed in the Xie reference,

the first color pixels and the second color pixels repeatedly arranged on odd row lines of the pixel array in this order;

and the second color pixels and the third color pixels repeatedly arranged on even row lines of the pixel array in this order (Figure 6).

For claim 4, the Yiannoulos, Xie, and Xiao references disclose all the previous limitations.

Xiao teaches in his apparatus wherein the selecting means selects the appropriate analog reference voltage in accordance with different values of analog reference voltage signals (Figure 6). Xiao's method of selecting different analog signals can easily be altered by one of ordinary skill in the art to use different analog reference voltages of color pixels.

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It is well known in the art to select first and second analog reference voltages for a given column of an image array having columns parallel with Analog-Digital Conversion, as disclosed in Figures 1 and 2 of Xiao.

In Figure 2 of Xiao, it is disclosed that the selecting means on each column line select the pixel data from each respective column. The columns are either even or odd.

For claim 5, the Yiannoulos, Xie, and Xiao references disclose the first color pixel is a red color pixel, the second color pixel is a green color pixel, and the third color pixel is a green color pixel (Column 10, Line 4).

For claim 6, the Yiannoulos, Xie, and Xiao references disclose all the previous limitations and also wherein the selecting means is a multiplexer (Xiao; Figure 2 Element 30; Column 2, Line 30-33).

### *Conclusion*

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

7. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L Solomon whose telephone number is (703)-305-4370.

9. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary, Vu Le can be reached on (703)-308-6613.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

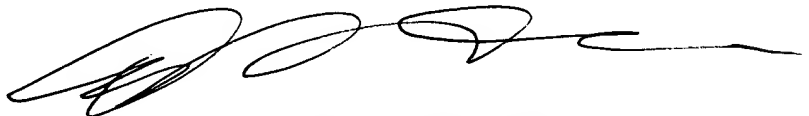
**Or faxed to:**

**(703) 872-9314**, (for informal or draft communications, please label  
"Proposed" or "Draft")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,  
Arlington, VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be  
directed to the customer service number **(703) 306-0377**.

February 23, 2004



**ANDREW CHRISTENSEN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600**